Rapid propagation of *Lachenalia* hybrids *in vitro*

Dorothea D. Nel

Horticultural Research Institute, Private Bag X 293, Pretoria 0001, Republic of South Africa

Accepted 14 April 1983

Tissue culture techniques were used to propagate five new cultivars and five selections of *Lachenalia*. Two thousand plants from a single leaf of each cultivar/selection were produced within eight months. For plantlet regeneration 2 mg N^6-benzylaminopurine and 0,1 mg naphthalene acetic acid per dm^3 basal medium were used. Rooting was initiated by 2 mg indole-3-butyric acid per dm^3 of the basal medium.

Weefselkultuurtegnieke is gebruik om vyf nuwe cultivars en vyf seleksies van *Lachenalia* te vermeerder. Twee duisend plantjies van 'n enkele blaar van elke cultivar/seleksie is binne agt maande verkry. Regenerasie van plantjies het op 'n basiese medium wat met 2 mg N^6-bensielaminopurien en 0,1 mg naftaleenasynsuur per dm^3 verryk is, plaasgevind. Vir beworteling was 2 mg indoolbottersuur per dm^3 van die basiese medium nodig.

Keywords: Auxin, indole-3-butyric acid, *Lachenalia* rapid propagation, tissue culture

In recent years *Lachenalia* spp. Jacq. have attracted much attention as a potential pot and bedding plant. The breeders at the Horticultural Research Institute, Dept. of Agriculture, Pretoria therefore included this indigenous bulb in their programme and several promising hybrids have been developed (Figure 1). Out of these a number have already been chosen as cultivars. To accelerate the propagation, tissue culture methods have been successfully applied to five cultivars and five selections.

A preliminary report on the tissue culture of Lachenalias has been published (Klesser & Nel 1976).

The method and medium used for the multiplication of the plant tissue were similar to those described for an *Ornithogalum* hybrid (Nel 1981) and 1 cm^2 leaf explants were used as the initial source.

Leaves were surface sterilized by a quick dip into alcohol (96%), a 15 min soak in a 15% solution of a commercial bleach containing 5% sodium hypochlorite, followed by two rinses in sterile distilled water. The basal medium (BM) contained the inorganic salts of Murashige and Skoog (1962); Na Fe EDTA (25 mg dm^{-3}), sucrose (30 g dm^{-3}), myonositol (100 mg dm^{-3}), thiamine-HC1 (0,5 mg dm^{-3}) and agar (7 g dm^{-3}). For plantlet regeneration 2 mg N^6-benzylaminopurine and 0,1 mg naphthalene acetic acid were added per dm^3 of the BM (Medium 1). For root formation the auxin indole-3-butyric acid (2 mg dm^{-3}) was found to give better results than the previously reported (Klesser & Nel 1976) naphthalene acetic acid (Medium 2). The pH of the medium was adjusted to 6,2 with 1 mol dm^{-3} NaOH before the addition of the agar. Aliquots of 12,5 cm^3 were dispensed into 19 × 150 mm test tubes and

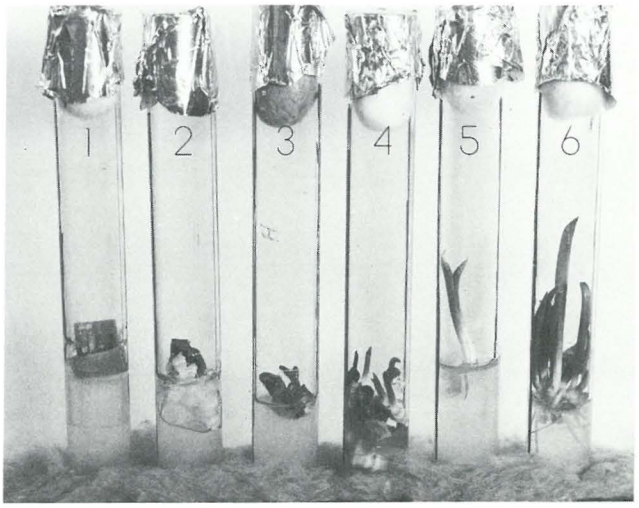

Figure 2 Stages in the *in vitro* multiplication of a *Lachenalia* cultivar. Stages 1 – 4 on Medium 1: 1. Excised leaf. 2. Regeneration of plantlets three weeks after culturing. 3. Subculture from stage 2. 4. Development of stage 3 after four weeks. Stages 5 – 6 on Medium 2: 5. Individual plantlet from stage 4. 6. Rooted plantlets.

Figure 1 New *Lachenalia* cultivars.

Figure 3 Trays with young plantlets.

autoclaved at 105 kPa for 15 min. Cultures were incubated at a temperature of 23°C and a 16-h photoperiod. Light irradiance was approximately 8,8 Wm^{-2} (6 000 lx) at explant level.

After four weeks on Medium 1 tiny sprouts appeared on the leaf explants and about two weeks later the cluster could be cut up and subcultured on fresh medium (Figure 2, stage 1 – 3). A second subculture on Medium 1 was necessary to obtain a large number of plantlets. At the third subculture, Medium 2 was used for rooting and two to four plantlets were placed in the tube (Figure 2, stages 5 – 6). When the roots were well developed the plants were transferred to trays filled with sterile potting soil (Figure 3).

It was found that it was important to start cultures from mature but non-senescent leaves. This usually coincides with the opening of the first florets on the inflorescence.

Using this technique the present target of 2 000 bulblets from a single leaf of each cultivar/selection could be reached within eight months.

References

KLESSER, P.J. & NEL, D.D. 1976. Virus diseases and tissue culture of some South African bulbs. *Acta. Hort.* 59: 71 – 76.

NEL, DOROTHEA D. 1981. Rapid propagation of *Ornithogalum* hybrid *in vitro*. *Agroplantae* 13: 83 – 84.

MURASHIGE, T. & SKOOG, F. 1962. A revised medium for rapid growth and bio-assays with tobacco tissue culture. *Physiol. Plant.* 15: 473 – 479.